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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* CARSTEN ROHR,  
KEITH W. J. BARNHAM,  
NICHOLAS EKINS-DAUKES,  
JAMES P. CONNOLLY, IAN M. BALLARD  
AND MASSIMO MAZZER

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Appeal 2006-2150  
Application 09/955,297  
Technology Center 1700

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Decided: January 31, 2008

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Before MICHAEL R. FLEMING, *Chief Administrative Patent Judge*,  
BRADLEY R. GARRIS, *Administrative Patent Judge*, FRED E.  
MCKELVEY, *Senior Administrative Patent Judge*, CHARLES F.  
WARREN, and JEFFREY T. SMITH, *Administrative Patent Judges*.

*Per Curium.*

DECISION ON REQUEST FOR REHEARING

This is in response to Appellants' Request, filed February 8, 2007,  
and Supplement to Request, filed May 24, 2007, for Rehearing of the

Decision, mailed December 8, 2006, wherein a merits panel of the Board affirmed the Examiner's rejections of the appealed claims under 35 U.S.C. § 102 and § 103.

As background, Appellants claim a photovoltaic device comprising a plurality of quantum wells and barriers having tensile strained layers and compressively strained layers wherein these layers have compositions such that a period of one tensile strained layer and one compressively strained layer exerts "substantially no shear force on a neighboring structure" (claim 1). All of the § 102 and § 103 rejections of the appealed claims are predicated on the Examiner's determination that, in the strain-balanced GaAsP/InGaAs quantum well solar cells of Ekins-Daukes, a period of one tensile strained layer and one compressively strained layer will necessarily and inherently exert "substantially no shear force on a neighboring structure" (*id.*) as required by the appealed claims. Because the merits panel agreed with this determination, the Examiner's § 102 and § 103 rejections were affirmed.

In the Request and Supplement, Appellants contend the merits panel erred in determining that the Examiner had established a *prima facie* case of unpatentability based on inherency which had not been successfully rebutted by the arguments in the Briefs or by the Anderson Declaration of record under 37 C.F.R. § 1.132. This contention is unpersuasive for the reasons detailed below.

I.

In support of their Request for Rehearing (Supplement 1-2), Appellants call our attention to *Brand v. Miller*, 487 F.3d 862 (Fed. Cir. 2007), an *inter partes* appeal in which the Director was not a party. Under *Brand v. Miller*, Appellants maintain that the merits panel erred because it failed to base its decision declining to accord weight to the Anderson Rule 132 Declaration with evidence in the record. For reasons which follow, we find nothing in *Brand v. Miller* that establishes the merits panel erred or which compels reversal of the Examiner's rejections in this case.

II.

A.

*Brand v. Miller*, relying on *Dickenson v. Zurko*, 527 U.S. 150 (1999) (an *ex parte* appeal), and *In re Gartside*, 203 F.3d 1305 (Fed. Cir. 2000) (an *inter partes* appeal), holds that findings of fact by the Board must in all cases be supported by substantial evidence in the record. 487 F.3d at 868. *Brand v. Miller* goes on to say that under the substantial evidence standard of review, the Federal Circuit searches for evidence, clearly set forth in the record below, to justify the conclusions that the Board has drawn. *Id.*

Substantial evidence means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion. *Consolidated Edison Co. v. NLRB*, 305 U.S. 197, 229-30 (1938). Substantial evidence does not mean a large or considerable amount of evidence, but rather such evidence as a reasonable mind might accept as adequate to support a conclusion. *Pierce v. Underwood*, 487 U.S. 552, 565 (1988). "[T]he possibility of drawing two inconsistent conclusions from the evidence does

not prevent an administrative agency's finding from being supported by substantial evidence." *Consolo v. Federal Maritime Comm'n*, 383 U.S. 607, 620 (1966).

The *Brand v. Miller* opinion cites and discusses *Baltimore & Ohio R.R. Co. v. Aberdeen & Rockfish R.R. Co.*, 393 U.S. 87 (1968), a railroad ratemaking proceeding involving competing claims by different railroads. The Supreme Court held, in the context of an *inter partes* ratemaking proceeding before the Interstate Commerce Commission, that agency expertise cannot substitute for evidence in the record. 393 U.S. at 92. The Supreme Court felt that unless an agency decision is based on substantial evidence and reasoned findings, effective judicial review would become lost in a haze of so-called expertise. *Id.* "Administrative expertise would then be on its way to becoming 'a monster which rules with no practical limits on its discretion.'" *Id.*

*Brand v. Miller* discusses the detailed PTO regulations governing interferences and other contested cases. 487 F.3d at 869. The Federal Circuit concluded that the detailed *inter partes* regulations "highlight the Board's role in ... [*inter partes*] cases as an impartial adjudicator of an adversarial dispute between two parties." *Id.* In the context of a contested case, the Federal Circuit held that it is impermissible for the Board to base its factual findings on its expertise rather than on evidence in the record. *Id.* Nevertheless, the Federal Circuit recognized the Board's expertise and held that that expertise appropriately plays a role in interpreting record evidence.

*Id.* The Federal Circuit did not decide the extent to which the Board in *ex parte* proceedings is so limited. *Id.*

B.

Members of the Board are "persons of competent legal knowledge and scientific ability ..." 35 U.S.C. § 6(a). Patent examiners too are assumed to have some expertise in interpreting the references upon which they rely and to be familiar from their work with the level of skill in the art. *Am. Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1354 (Fed. Cir. 1984). However, patent examiners and members of the Board are not "experts" in all technologies involved in the myriad of applications which come before the Board. Nor is the actual scientific knowledge of any particular examiner or member of the Board relevant. *Western Elec. Co. v. Piezo Tech., Inc. v. Quigg*, 860 F.2d 428, 433 (Fed. Cir. 1988) (holding that the district court abused its discretion in ordering discovery of an examiner's scientific background).

While administrative action is entitled to particular deference when it concerns highly technical, scientific questions within the agency's expertise [*i.e.*, making scientific findings in support of a legal conclusion of obviousness], *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87, 103 (1983), consistent with *Brand v. Miller*, examiners and members of the Board perform a quasi-judicial function based on record before PTO. *Compagnie de St. Gobain v. Brenner*, 386 F.2d 985, 987 (D.C. Cir. 1967). It follows that Appellants' assertion that "[t]here is no evidence of record that the Examiner has any background,

experience or training in the field of the claimed invention" (Supplement 2) is irrelevant to any issue before us. The only question becomes whether the record supports the findings and credibility assessments made in connection with the rejections in this case. *Compare Fromson v. Anitec Printing Plates, Inc.*, 132 F.3d 1437, 1448 (Fed. Cir. 1997) (Mayer, C.J., concurring) ("I 'know' what anodization means from my own undergraduate studies and experiments; the concept is not difficult and I need no further education to grasp it. I happen to have a dictionary in my chambers from the era pertinent here, which would confirm my 'knowledge' about anodization. \*\*\*. But, I am neither an expert in the field nor one of ordinary skill in the art despite how much I think I 'know' about a process I once studied. Nor do my colleagues on this court or the district court possess such expertise, and even if they did, they would have to defer to the record made in the case.")

C.

As noted earlier, in *Brand v. Miller*, the Federal Circuit observed that the Board is an "impartial adjudicator" in an interference and declined to determine whether any limitations on Board activity in an interference also applies to *ex parte* proceedings. Our expectation, like that of the examiners, is that we are also viewed as acting impartially when resolving *ex parte* matters.

In an interference, the Board has jurisdiction to consider priority of invention and patentability. 35 U.S.C. § 6(b). The issue before the Federal Circuit in *Brand v. Miller* was priority of invention. On the issue of priority, the Director has no particular interest in which inventor is "first." Having

determined that an invention is patentable, at least as of the time the interference is declared, the Director's question becomes: "Who is first?" When two inventors claim the same patentable invention, the answer to the question is necessary for the Director to carry examination under 35 U.S.C. §§ 131-132. Ordinarily, the Director will have no information or evidence showing which inventor is first. Accordingly, the Patent Statute provides that the Board shall determine priority where priority evidence is almost always presented by the parties.

Patentability, on the other hand, is the essence of examination, a responsibility which primarily falls on the PTO. *Graham v. John Deere Co.*, 383 U.S. 1, 18 (1966). Ordinarily, the evidence upon which a rejection for unpatentability is based comes to the attention of the PTO through (1) searches by examiners, (2) *ex parte* submissions by applicants [37 C.F.R. §§ 1.56 and 1.97], and (3) submissions from third-parties after publication of an application [37 C.F.R. § 1.291]. In an interference, patentability evidence may be offered by either party.

There is a significant difference between priority of invention and patentability. Parties involved in an interference may arbitrate any aspect of the interference, but arbitration does not preclude the Director from determining patentability. 35 U.S.C. § 135(d); 37 C.F.R. § 41.126(a). An arbitrator's decision that one party is the first to invent or that subject matter involved in the interference is unpatentable is binding on the parties. But, an arbitrator's decision that subject matter is patentable is not binding on the Director. 35 U.S.C. § 135(d), last sentence.



If the Director is of the opinion that subject matter in an interference is unpatentable, appropriate *ex parte* action can be taken by an examiner after an interference is over. *Krasnow v. Bender*, 170 F.2d 560 (CCPA 1948). If the Board is of the opinion that subject matter in an interference is unpatentable, upon notice and an opportunity to be heard, appropriate *inter partes* action can be taken *sua sponte* by the Board in the interference. 37 C.F.R. § 41.121(f); *see also In re Gartside*, 203 F.3d 1305, 1315 (Fed. Cir. 2000) (the Board has authority to consider *sua sponte* patentability, citing former 37 C.F.R. § 1.641(a), which has been replaced by 37 C.F.R. § 41.121(f)). We do not view suggesting unpatentability and thereafter resolving the merits of the suggestion (even if unfavorable) as undermining our impartiality in an interference any more than when a new ground of rejection (37 C.F.R. § 41.50(d)) is made in an *ex parte* appeal.

### III.

There are two considerations which we do not believe are in any way undermined by *Brand v. Miller*. The first consideration is that the examiner in the first instance and the Board on appeal determine the weight and credibility to be given to evidence. The second consideration is that, where appropriate, common sense has an appropriate place in dispute resolution in cases before the Board.

#### A.

Determining weight to be given evidence is an important role in factfinding. The Board has broad discretion as to the weight to be given

declarations offered in the course of prosecution, and it may properly decline to accord weight to declaration statements unsupported by corroborating documentation. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004). *See also In re Curtis*, 354 F.3d 1347, 1354 (Fed. Cir. 2004).

*Brand v. Miller* in no way requires that the Office produce a document to question the credibility of a declaration under 37 C.F.R. § 1.132. Rather, an examiner or the Board may question credibility based on a declarant failing to provide an underlying basis for an assertion in a declaration. *Rohm and Haas Co. v. Brotech Corp.*, 127 F.3d 1089, 1092 (Fed. Cir. 1997) (nothing in the Federal Rules of Evidence or Federal Circuit jurisprudence requires the fact finder to credit the unsupported assertions of an expert witness); *Bruning v. Hirose*, 161 F.3d 681, 686 (Fed. Cir. 1998) (conclusory and speculative testimony by an expert witness will not suffice to establish a preponderance of the evidence).

Contrary to the Appellants' suggestion, it is not "clear error" (Supplement 3) for an examiner or the Board to question the sufficiency of a declaration. Questioning the sufficiency of a declaration is not substituting our opinion for that of an "expert." Rather, any absence of a credible response by an appellant to the question forms part of any explanation on the record why weight is not given to evidence in the record even without observation of demeanor. *Ecolochem, Inc. v. Southern California Edison Co.*, 227 F.3d 1361, 1379 (Fed. Cir. 2000). *See also In re Crish*, 393 F.3d

1253, 1259 (Fed. Cir. 2004) (Federal Circuit found no error with board's credibility determination that appellant's own work, as recited in his application, is better evidence than that of a journal article by Lopez-Bayghen's work).

B.

While not an issue in this appeal, we nevertheless take this opportunity to discuss a second consideration not discussed in *Brand v. Miller*. The application in obviousness determinations of appropriate "common sense" is permissible. *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1742 (2007). Nothing in *Brand v. Miller* undermines the use of common sense in resolving patentability. *Cf. Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007); *In re Translogic Technologies, Inc.*, 504 F.3d 1249, 1259-60 (Fed. Cir. 2007). Common sense gathered through expertise and experience often provides the basis for questioning the sufficiency of evidence before the Board.

IV.

With these principles in mind, we now respond to Appellants' arguments in the Request for Rehearing and Supplement addressing points supposedly overlooked by the merits panel in rendering its initial Decision.

A.

Appellants argue no evidence supports the merits panel's determination that the strain-balanced solar cells of Ekins-Daukes would inherently possess the disputed claim feature "a period of one tensile strained layer and one compressively strained layer exerts substantially<sup>1</sup> no shear force on a neighboring structure" (claim 1) (Request 7-8, 13). This argument is not convincing.

On page 4 of the Decision, the merits panel stated that an inherency determination is supported by fact and technical reasoning presented by the Examiner at pages 5 and 6 of the Supplemental Examiner's Answer mailed December 23, 2005. In this Supplemental Answer (which included quotation from the Supplemental Examiner's Answer mailed August 9, 2005), the Examiner found that the particular materials or compositions of the Ekins-Daukes solar cells would have similar lattice constants and therefore substantially no stress and concomitantly substantially no shear

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<sup>1</sup> We reiterate the comment made in footnote 1 of the Decision that the Examiner should consider whether the claim term "substantially," which is a word of degree, violates the second paragraph of 35 U.S.C. § 112. As explained in the footnote, this is because the Examiner has found, and Appellants have not disputed, that the Specification contains no definition or guidance by which to measure the degree of shear force encompassed by the term "substantially." See *Seattle Box v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984) (when a word of degree is used, the fact finder must determine whether the specification provides some standard for measuring that degree). We acknowledge Appellants' point (Request 14) that a § 112, second paragraph, rejection based on this claim term had been made and then withdrawn during prior prosecution before a previous Examiner. However, the withdrawal of this rejection appears to have been inappropriate due to the afore-noted lack of definition or guidance.

force as required by the appealed claims. Moreover, the merits panel stated that the Examiner's inherency position is reinforced by the fact that "the appealed claims define the 'substantially no shear force' limitation as resulting from layer compositions which include those of Ekins-Daukes [as revealed by comparing] the compositions defined by appealed claims 12 and 13 with the compositions disclosed on page 4195 of the Ekins-Daukes reference" (Decision 4).

In their Request and Supplement, Appellants do not contest the Examiner's finding that "there will be very little difference between the lattice constants for the GaAs,  $\text{GaAs}_{0.939}\text{P}_{0.061}$ , and  $\text{In}_{0.17}\text{Ga}_{0.83}\text{As}$  [of the Ekins-Daukes solar cells]" (December 23, 2005 Supplemental Answer, page 6, quoting from August 9, 2005 Supplemental Answer, page 3). However, Appellants disagree with the merits panel's finding that the claimed compositions responsible for producing "substantially no shear force" include those of Ekins-Daukes. According to Appellants, "claim 13 specifies that the 'multiple quantum well portion is formed of layers of  **$\text{In}_x\text{Ga}_{1-x}\text{As}, \text{P}_{1-y}$** , where  $0 \leq x \leq 1$  and  $0 \leq y \leq 1$ ,' and this same composition is completely missing from the Ekins-Daukes reference" (Request 10). This assertion is erroneous. Where  $y = 1$ , the claim 13 formula becomes  $\text{In}_x\text{Ga}_{1-x}\text{As}$ , and as Appellants concede "Ekins-Daukes does disclose **InGaAs** layers" (Request 10) (specifically  $\text{In}_{0.17}\text{Ga}_{0.83}\text{As}$  (Ekins-Daukes, 4195, first full para. in second column)).

As argued at Request 4 and disclosed in more detail at Specification 11-12, Appellants' invention seeks not only the strain-balanced goal of

Ekins-Daukes but also a zero-stress situation such that a period of tensile and compressively strained layers exerts substantially no shear force on a neighboring structure. Appellants' desired zero-stress situation is said to be obtained by taking into account differences in elastic properties of the device layers (Specification 11) according to specific equations which also take into account lattice constant matching (Specification 12).<sup>2</sup> The merits panel's inherency determination is supported by the Examiner's above-noted finding and technical reasoning that there will be very little difference between the lattice constants for the particular materials of Ekins-Daukes (i.e., lattice constant matching) and that such little difference militates for a zero-stress situation which would exhibit substantially no shear force as required by Appellants' claims. This inherency determination also is supported by the fact that the particular compositions of Ekins-Daukes are encompassed by the appealed claims and therefore presumptively would possess the previously discussed elastic properties which are said to be responsible for producing Appellants' claimed "substantially no shear force" characteristic.

The above discussed facts and technical reasoning establish a prima facie case that the strain-balanced solar cells of Ekins-Daukes would inherently possess the "substantially no shear force" characteristic required by the appealed claims. *See In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (to establish inherency, evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the

<sup>2</sup> We emphasize that the broadest claim on appeal, which is claim 1, does not require the "substantially no shear force" feature be achieved by way of such equations.

reference); *see also Ex parte Levy*, 17 USPQ2d 1461, 1463-64 (BPAI 1990) (evidence of inherency includes fact and/or technical reasoning). Appellants state that "the Ekins-Daukes reference could only provide 'no shear force' if it accidentally used materials which had the same elastic stiffness coefficients" (Request 4). However, this statement begs the pivotal issue of whether the specific materials actually used by Ekins-Daukes inherently possess elastic properties which would result in "substantially no shear force."<sup>3</sup> It is irrelevant that the Ekins-Daukes materials possess such elastic properties by accident. This is because unpatentability based on inherency is proper regardless of whether artisans recognize the inherent characteristic or functioning of the prior art. *See In re Cruciferous Sprout Litigation*, 301 F.3d 1343, 1349 (Fed. Cir. 2002).

For these reasons, Appellants' arguments do not persuade us that the merits panel erred in determining a prima facie case exists for the Examiner's inherency position (Decision 4-5). Correspondingly, there was no error in the merits panel's determination (*id.*) that it is Appellants' burden to prove that the solar cells of Ekins-Daukes do not inherently possess the "substantially no shear force" characteristic of the here claimed photovoltaic device. *See In re Best*, 562 F.2d 1252, 1255 (CCPA 1977).

B.

In an attempt to carry this burden, Appellants argue that the Examiner's inherency position is controverted by the Anderson Declaration

<sup>3</sup> Resolving this issue requires properly allocating the burden of proof since the PTO has no laboratory in which to determine the elastic stiffness coefficients of the materials described in Ekins-Daukes.

(Request 8-9). Appellants contend that, "even if a prima facie case were to have been made, it has been rebutted by the expert testimony of Dr. Anderson" (Request 13) and that "the Board has either ignored, failed to consider or failed to [give] appropriate weight to the testimony of Appellants' expert witness, Dr. Anderson" (Request 15). Appellants further argue that "[n]either the Examiner nor the Board have supplied any evidence, as opposed to unsupported opinion, rebutting or disputing the factual findings expressed in the [Anderson] Declaration" and that "[i]t is clear error for the Board to substitute its own opinion for the Declaration evidence of record" (Supplement 3). As support for this argument, Appellants rely on the above discussed *Brand v. Miller* authority (Supplement 1-2).

Appellants have misperceived the merits panel's reason for considering the Anderson Declaration insufficient to carry Appellants' burden of proof. As explained by the merits panel, Appellants have not carried their burden because both the Appellants in their Briefs and Dr. Anderson in the § 1.132 Declaration have failed to address the specific compositions disclosed by Ekins-Daukes (Decision 5).

Specifically, Dr. Anderson's statements at paragraphs 10-12 (Declaration 5), which Appellants characterize as "fact testimony" (Request 8-9), are merely conclusory statements without factual support. In this latter regard, none of these statements addresses the specific compositions disclosed by Ekins-Daukes which comprise InGaAs quantum wells and GaAsP barriers on GaAs substrates (Abstract; 4195, first and second



columns). In fact, at paragraph 12 Dr. Anderson incorrectly identifies the Ekins-Daukes GaAs substrate composition as an InP substrate ("The Ekins-Daukes I disclosure teaches that the thickness-weighted average lattice constant of wells and barriers is roughly the same as the InP substrate but this is insufficiently exact to ensure periods which exert 'substantially no shear force on a neighboring structure.'" (emphasis added)). It follows that the merits panel properly declined to credit Declarant's testimony since it is based on conclusory statements that are factually erroneous as well as factually unsupported. *Rohm and Haas Co. v. Brotech Corp.*, 127 F.3d at 1092.

Therefore, contrary to Appellants' argument, the merits panel did not commit error by substituting "its own opinion for the Declaration evidence of record" (Supplement 3). Instead, the merits panel considered, interpreted and weighed the Declaration evidence and found the statements made therein to be erroneous and conclusory for lack of factual support due to Declarant's failure to accurately identify and address the specific compositions disclosed by Ekins-Duakes. For these reasons, the panel ultimately accorded the Anderson Declaration limited probative weight which was inadequate to counterbalance the record evidence supporting the Examiner's inherency position.

As previously explained, the Board has broad discretion as to the weight given to declarations offered in the course of prosecution. *In re Acad. Sci. Tech. Ctr.*, 367 F.3d at 1368. Moreover, the Board is entitled to weigh such declarations and conclude that a lack of factual corroboration

warrants discounting the opinions expressed in the declarations. *Id.* Finally, nothing in *Brand v. Miller* limits this broad discretion of the Board to weigh declaration evidence during *ex parte* prosecution. To the contrary, the *Brand* decision expressly recognized that the Board's expertise appropriately plays a role in interpreting record evidence. 487 F.3d at 869. These authorities establish that the merits panel properly exercised its discretion in evaluating the Anderson Declaration and finding it inadequate to carry Appellants' burden of proving that the Ekins-Daukes solar cells do not inherently possess the "substantially no shear force" characteristic of the photovoltaic device defined by the appealed claims.

V.

On this record, Appellants have failed to persuade us that the merits panel erred in affirming the Examiner's decision rejecting the claims on appeal.

The Request for Rehearing is DENIED.

Appeal 2006-2150  
Application 09/955,297

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NIXON & VANDERHYE, P.C.  
901 NORTH GLEBE ROAD, 11<sup>TH</sup> FLOOR  
ARLINGTON, VA 22203